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What are the determinants for public library borrowing? Lessons from the Helsinki region

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Abstract

Finns are heavy users of public libraries, and the list of the most borrowed books is regularly published in local newspapers, which only include the most wanted books, 5–10 each week. However, the determinants of book loans from libraries are not known. The aim of this study is to fill in this gap and investigate the determinants of book loans from Helmet public libraries (Helsinki region). Using Martin's (1993) model, this approach proposes that we should observe a negative relationship between the retail price and the number of loans of each book because the library would prefer to purchase popular but not too expensive books. The results indicate that retail price, as well as author recognition and public awareness about the novel, indeed has an impact on borrowing. This implies that library managers should respond to all available information on the determinants of borrowing and should try to minimize long queues of citizens when they are waiting for the current hit novel to be available to borrow from the library.

Keywords: public library, economic theory, loans, Helsinki region

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Finnish citizens are frequent users of public libraries. In 2017, the total number of loans per citizen from municipal libraries was 15.57. To put this into context, the same figure in Japan is about five and Qatar less than one (Statista, 2022). Most loans were books (12.17 per resident), but visual media and music recordings have also been common. Given the high number of loans, municipal libraries in Finland have consistently increased their stocks of books, recordings, and periodicals. Recently, annual book acquisitions per 1,000 residents have been around 300 while the acquisitions of music recordings, visual media, and periodicals have ranged from 11 to 20. E-book collections though have increased substantially since the 2010s. In terms of expenses, the overall expenses per inhabitant recently have been a bit less than 60 euros annually while the share of personnel expenses has been approximately 57 percent and the share of acquisitions has been about 12 percent (Finnish Public Library Statistics, n.d.).

The Finnish Public Libraries Act states that its purpose is to promote equal opportunities for the population that can improve culture, the availability and use of information, reading culture and versatile ability to read, opportunities for lifelong learning, as well as the development of knowledge, active citizenship, and freedom of speech. The starting point in achieving these objectives are pluralism, cultural variety, and a sense of community. In Finland, municipalities are responsible for offering public libraries and the two main sources of income are local allowances and state grants.

The purpose of this study is to analyze the trend of public library borrowing in Finland. Specifically, what are the determinants of borrowing? What is the role, for example, of book prices, prizes, and reviews published in the media? This research explores borrowing statistics and explanatory variables using conventional regression analysis, particularly given the situation that as borrowing is free of charge for the citizens and public libraries have a limited budget, there are not enough books to satisfy demand (Lukkarinen, 2011). In the same vein, when public libraries do not have enough books, patrons can make a reservation and are given notice when the book is available (Verdaasdonk, 1983; van Peer, 2008; Tuomi, 2017). In an ideal sense, libraries select the best-quality reading material for the greatest number of readers at the lowest possible price. The choice is time-dependent, and the social and cultural climate as well as other external factors such as customs, norms, and values of the time must be considered (Kannila, 1966; Kannila, 1967; Vuorenrinne, 2015).

The quality of literature is linked to the question of good or bad taste but the distinction between these can be difficult to measure. The collection must include both popular literature and a wide range of material that is not available elsewhere (van Peer, 2008; Koolen et al.,

2020). However, earlier studies have not examined the relationship between borrowing demand and what determines it. This article intends to widen the rationale behind this demand given that the importance of the retail price of literature has not been studied previously, this will also be discussed in depth.

Borrowing demand in the empirical setting is not only related to literary prizes, author recognition, and reviews published in the media, but also to the purchasing price of the book which has been of little focus (Ashworth et al., 2010; Schmidt-Stölting et al., 2011; Ponzo and Scoppa, 2015; Asai, 2016). The aim of this study then is to use Martin's mathematical model (1993) in which the economically best solution to scarcity is determined for correlating librarians' actions in relation to the demands among borrowers for books. This model is rather mathematically difficult but the outcome or the optimal behavior is clear. Furthermore, the model assumes that librarians must consider the costs related to the purchasing of books and putting them on display, as well as the revenues. When discussing the revenues of the library, these are subsidies from the municipality, and, for simplicity, are related to the purchase price of the book. The model outcome or the hypothesis to be tested is that the purchasing price is negatively related to the borrowing demand that a priori seems against expectations.

Usually, the demand for any good responds to changes in income or price (Mankiw and Taylor, 2014). The effect of income is usually measured by income elasticity, which shows the change in demand relative to a given change in income. If the income increases by 10 percent, for instance, and demand increases by 15 percent, the income elasticity will be 15/10 = 1.5. In this case, demand is described as income-sensitive because the income elasticity is greater than 1. Nonsensitivity implies an income elasticity between 0 and 1, and the good is termed inferior if the income elasticity is less than 0. Price elasticities are measured correspondingly: the change in demand relative to a given change in price. If, for instance, the price of a good increases by 10 percent and the demand decreases by 5 percent, the own-price elasticity will be −5/10=−0.5. In this case, the good in question is described as price-insensitive because the own-price elasticity is greater than −1.

On the other hand, it would be described as price-sensitive if the own-price elasticity is less than −1. If the demand for a good goes up, for instance by 12 percent, when the price of another good also goes up, say by 15 percent, the corresponding cross-price elasticity is greater than 0 (0.8 in our example), and the goods in question are then substitutes. If the cross-price elasticity is negative, the goods are complements.

Several studies have shown that the income elasticity for book demand is higher than one indicating that the demand for books is income-sensitive (Hjorth-Andersen, 2000; Ringstad and Løyland, 2006). Book demand is also rather price sensitive (Bittlingmayer, 1992), and books and other cultural goods seem to be substitutes. However, the focus for this study is library books that are free for patrons.

In the Helsinki region, there is one library card (Helmet) that is valid in the cities of Helsinki (population 614,537 in 2014), Espoo (261,656), Vantaa (208,516), and Kauniainen (9,037) (Helmet, n.d.). The population in the capital region is large and data is easily available for the purpose of this study. A person who possesses a Helmet library card is allowed to borrow any book or other item from one of 69 libraries in the region, which breaks down to 39 in Helsinki, 18 in Espoo, 11 in Vantaa, and 1 in Kauniainen. In addition to these, there are other libraries in the Helsinki region, such as several university libraries, the National Library of Finland, and the Library of Parliament.

According to the Finnish Public Library Statistics (n.d.), libraries in the Helsinki region hold typically less than 400 copies of books in the bestseller category and it can be expected that patrons will on occasion need to wait until they are able to borrow these popular titles. The annual sales number for most sold novels has varied between 10.000 and 74,000 in Finland. This study focuses on the most borrowed novels because the data is easily accessible and in many cases these novels belong to the bestseller list.

1. Problem Statement

Given that consumers have difficulty judging the overall quality of a book before purchase, a loan from a public library can be a costless method to access the book. However, the number of copies available in public libraries is often very limited in relation to demand. The ratings or prizes given by experts create a convenient mechanism to convey information when the book's quality is unknown (Reinstein and Snyder, 2005), however, this might only lead to greater demand in public libraries, which translates to an opportunity cost that must be considered when consumers make the decision between purchasing a particular book or borrowing it from the library. A substantial proportion of research on reading trends has dealt with book purchases (as follows) and library management. For example, there have been special issues in Library Management on performance measurement (Town and Stein, 2015) and the future roles of librarians (Martzoukou, 2017).

The purpose of this study is to investigate the determinants of book loans from public libraries in the Helsinki region. As such it asks what role does the purchasing price, awarding of prizes, and published reviews have upon book loan quantity? To address this question, the top 100 novels (the most borrowed books) among library loans in each quarter for the period 2014–2017 are examined for this study. Because we have no data concerning the borrowers, the analysis is based on the book and its characteristics, such as purchasing price and public awareness in terms of prizes and reviews by critics. Moreover, because the patron cannot immediately receive the book they want, there is always the possibility of having to make a reservation. It is reasonable to assume that author recognition, in terms of the number of published novels and prizes given, as well as reviews published in newspapers and magazines, have an important impact on borrowing demand (Ashworth et al., 2010; Ponzo and Scoppa, 2015). However, due to public-library financial restrictions (Kannila, 1967; Tuomi, 2017), the purchasing price of the novel is included in the model and empirical analysis. This combines these variables and estimates, particularly the price elasticity of the borrowing demand.

The structure of this article is as follows: a literature review is presented first, followed by the model which emphasizes the role of library budgeting in both the purchasing and boosting of the stock of books. A nonprofit public library is restricted in how much money it can spend and therefore there is a limit on book purchases. The result of the financial-resource scarcity in the model is a negative relationship between book price and borrowing, and this is empirically verified using Helmet data. A descriptive analysis is presented before the empirical estimation and results, and the conclusions are driven from these results.

2. Literature Review

There is very little literature on book demand. In his research on the German book market, Bittlingmayer (1992) shows that book demand is price-sensitive, with price elasticity between -2 and -3. With aggregate book demand, Hjorth-Andersen (2000) reveals that the price elasticity is about -1.4 in Denmark. Aggregate book demand is less price elastic than the demand for a single book. Increasing the particular book price reduces the demand for that book but simultaneously increases the demand for other books. Bearing in mind budget limitations, consumers seem to hang around in bookstores and look at several books. In line with Hjorth-Andersen (2000) and Prieto-Rodríguez et al. (2005) demonstrate that aggregate book demand is price elastic in Spain.

According to US data, Chevalier and Goolsbee (2003) argue that book demand with the online bookseller Barnes and Noble is far more price sensitive than that at Amazon.com, which shows an inelastic demand. This is similar in the case of Japanese paperback book demand (Asai, 2016). In Japan more than 40 percent of the titles in the sample presented by Asai have been released as paperback form only, and sequels also tend to follow this trend. Books seem to be income elastic (1.8 in Denmark;1.4 in Spain). Similar results have been discovered with Norwegian data from Ringstad and Løyland (2006). There are also large differences across households in purchasing behavior: single-person households or households with children (either less than 7 years old or 7–19 years old) tend to buy more books than other households, if their incomes are otherwise equal. Rather high values of the income elasticity of book demand indicate that public libraries are more than useful at promoting equal opportunities for education and culture to all citizens.

There is every reason to assume that the same books are both frequently purchased and borrowed, and that this decision is based on book attraction. Although it is generally difficult to measure the quality of the book before reading it, expert judgments and word-of-mouth are two important channels that relay information about whether the book is worth reading or not. Ashworth et al. (2010), using a two-year Dutch panel, highlights that winning a prize generally has a more positive effect on sales, whereas nominations do not. Similar results are presented by Ponzo and Scoppa (2015). Bittlingmayer (1992) argues that the most important variable for explaining book sales is the price of the book, but quality factors can be an important source of variation as well. The two most important signals for quality are positive reviews published in newspapers and magazines and the awarding of prizes. Moreover, bestseller lists may serve as a quality signal especially for debut writers (Sorensen, 2007).

Another measure is the author's previous sales have a positive impact on current sales (Schmidt-Stölting et al., 2011; Asai, 2016), indicating that writer recognition certainly has an effect. Beck (2007) addresses the importance of word-of-mouth effect on book sales: simply the lack of this leads to lower purchases. Advertising, in addition to the author's promotional activities, such as book signings and public appearances, increases book sales. However, the effect of advertising is decreased for bestselling authors compared to lesser-known authors, but a well-known high-profile author will have a higher book-sales figure (Shehu et al., 2014).

Although little analysis of the demand for print books in the primary market has been carried out, some knowledge of the effect of the main determinants has been established. No corresponding insight has been generated for the secondary market demand, specifically

borrowing from libraries (Løyland and Ringstad, 2011). However, there exist some studies on the topic of borrowing. Locher (2005) observes that in Germany fees reduce the number of borrowings, but the total amount of borrowing from a library does not decrease; this is due to an increase in per-user borrowing. It should be noted that some German libraries have a fixed user fee per year. Locher argues that the main determinants of the number of borrowings are the public library's financial resources and the size of its media and book collections. In Denmark (Johannsen, 2004), the budgetary effect of fee-based services is rather small; but they have an impact on the library's management. Fees also have a positive impact on librarian services, as employee motivation, entrepreneurial spirit, and focus on results seem to have improved. The results of fees on library behavior are, however, miscellaneous.

3. A Model Explaining the Relationship between Loans and Purchase Price

In Finland, a fee (minimal payment) is charged only if a book has been reserved or transported from another library, however, this has been scrapped. In the case of, say, using a library's 3D printer, there is a material cost to be paid by the user. Nevertheless, book borrowing is free of charge. Library law states that authors and translators receive grants from the state based on the number of borrowings from public libraries, with 90 percent of funds given to fiction while 10 percent is dedicated to nonfiction. In this way, this grant system is not imposed on the public-library cost structure.

Following the model of Martin (1993, p. 337) that was originally used to explain the secondhand market (trading in used books), we can assume for simplicity's sake that a publisher sells all books to a public library at price w, and the allowances and grants from local authorities (municipalities) and the central government (state) are interrelated to retail price p. All libraries at the start of each period purchase enough books up to capacity K (the capacity here refers to bookshelf capacity). Librarians can purchase new books if there is room on the bookshelves and stacks. The probability of a book being borrowed during the following period is λ. Expected loans in any period are λK, where λ depends on the library environment, such as population or location, and this is taken as a given for each library. The first argument in equation (1), "-w(λK)," characterizes the aforementioned. w is the purchasing cost of the book that might be related to retail price p. Libraries must pay w, whereas customers must pay p if they wish to buy the book.

At the end of the period, the model assumes that each library receives allowances and grants that are related to capacity, the borrowing probability, and the purchase price "$p(\lambda K)$,"

and pays the workers $gL(K)$, where g is the wage rate. By assumption, the number of workers L is a function of capacity K, with $\frac{\partial L}{\partial K} = L' > 0$ and $L'' > 0$ indicating that the library staff is positively related to library size (or capacity), "$L' > 0$," and staff costs increase with the size more than proportionally, "$L'' > 0$." The rental cost of capacity is ρcK, which points out that the library has to pay for heating and lighting. The expected present value of a library's finances is as follows.

$$E(PV) = -w(\lambda K) + \frac{1}{1+\rho}[p(\lambda K) - gL(K) - \rho cK]$$
$$+ \frac{1}{1+\rho}\left\{-w(\lambda K) + \frac{1}{1+\rho}[p(\lambda K) - gL(K) - \rho cK]\right\} + \cdots$$
$$= \frac{[p - (1+\rho)w]\lambda K - gL(K) - \rho cK}{\rho} \quad (1)$$

The expected present-value formulation expresses the net monetary payments out (costs related to loans "$w(\lambda K)$"] and monetary net revenues during the next period $[p(\lambda K) - gL(K) - \rho cK]$. The computation present value allows an economically meaningful comparison of nonsimultaneous sequential earnings and outlay streams. The discount rate ρ takes into account the different timings of earnings and outlay streams. One euro to be received after one year is not equal to one euro today. Assume that the interest rate is 0.10 and consider two alternative two-period earning streams: $y_1 = 100$, $y_2 = 330$, and $y_1 = 330$, $y_2 = 90$. The first stream contains 10 euros more, but the second is preferred at an interest rate of 0.10 $[100 + \frac{330}{(1+0,10)} = 400] < [330 + \frac{90}{(1+0.10)} = 411.8]$.

The inverse of the parameter λ is the average loan rate for books at a library. Presumably, the loan rate is related to the author's previous publication record and other impactful characteristics. This relationship will be analyzed in the following sections of this study.

The first-order condition for maximization of $E(PV)$ with respect to capacity K is as follows.

$$(2) \quad [p - (1+\rho)w]\lambda - gL'(K) - \rho c = 0$$

The present-value maximization capacity K level is as follows.

$$(3) \ K = (L')^{-1} \left\{ \frac{p - (1 + \rho)w] - \rho c}{g} \right\}$$

The critical probability $\underline{\lambda}$ (break-even loan rate) is defined by:

$$(4) \ [p - (1 + \rho)w]\lambda K - gL(K) - \rho cK = 0$$

We can use conditions (2) and (4) to eliminate $p - (1 + \rho)$ for a break-even library and achieve the result (5), showing that the value-maximizing-capacity-level elasticity of labor input with respect to capacity is 1.

$$(5) \ \frac{\partial L}{\partial K} \cdot \frac{K}{L(K)} = 1$$

For a break-even library, the value-maximizing level of capacity is independent of $\underline{\lambda}$. An increase of retail price reduces the break-even λ.

$$(6) \ \frac{\partial \underline{\lambda}}{\partial p} = - \frac{\lambda}{p - (1 + \rho)w} < 0$$

The last statement (6) proposes that we should observe a negative relationship between retail price and the number of loans for each book because the library would purchase fewer high-priced books. This is derived from equation (2) by taking the (mathematical) derivative of the break-even loan rate with respect to the retail price of a book. The reason for using a mathematical model is to justify the preceding relationship. There are also economic reasons to assume that the relationship exists. Based on that, we can propose our first hypothesis (H1).

(H1): Adult literature (novels) borrowing is negatively related to retail price.

The preceding model does not consider the behavior of publishers. They might, for example, print high volumes of popular books that result in lower prices due to the economics of scale. The quality of the novel is not modeled but we have reason to assume that the author's characteristics or reputation have an impact on borrowing. The model, especially condition (6),

is tested with the Helmet data. Another reasonable hypothesis (H2) is the positive relationship between public awareness and borrowing demand. There are several indicators for public awareness: author's previous publications, reviews among critics in newspapers and magazines, and nomination for a literary prize. We assume that these determinants are also relevant for book sales; the sales figures are used for controlling purposes.

(H2): Adult literature (novels) borrowing is positively related to public awareness and several indicators measuring awareness.

4. Data and Descriptive Analysis

The share of personnel costs over the sample period 2014–2017 in Helmet libraries was about 57 percent, the cost of premises 23 percent, material cost 12 percent, and acquisition cost about 7.5 percent (Finnish Public Library Statistics, n.d.). The material cost includes the purchase of newspapers and magazines as well as plastic coating for books expenditures. The separation of material cost and acquisition cost is important because the author receives public-lending-rights returns based on this expenditure. The material cost of e-books was less than 1 percent. The aforementioned sample was available when the research was carried out. Finland is a very suitable country for research because the literary rate has been extremely high for more than 100 years.
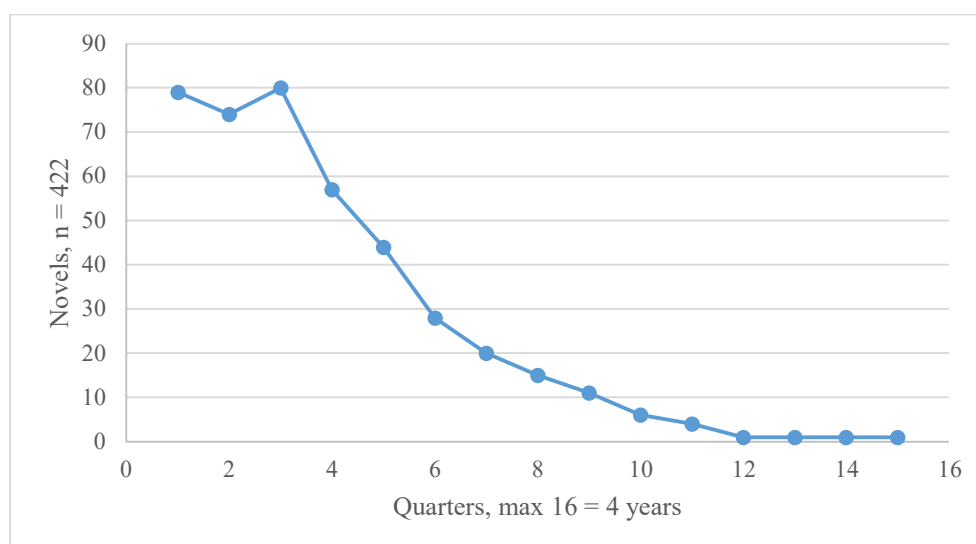
Figure 1. Novels in top-100 list according to quarters.

The sample size is 1,600 persons, covering four years and four quarters in each year from 2014 to 2017. The number of novels in the sample is 422. About 80 books were in the top 100 listings during only one quarter, as Figure 1 shows. The number of novels with a longer time than four quarters (more than one year) in the top 100 list is 132 (about 31 percent). One novel has been able to show up for 15 quarters. Thus, as shown in Figure 1, each book most often has one to three observations.

Next, Table 1 presents some descriptive statistics of the variables in the empirical setting. The price variable in the P 1 analysis is the price for one retailer Suomalainen Kirjakauppa which is available through the website (https://www.suomalainen.com/). The price was chosen because it was conveniently accessible. The retailer has three shops in Espoo, ten in Helsinki, and five in Vantaa, but has no shops in Kauniainen. These are the four towns where the public library Helmet is operating. The overall number of shops of Suomalainen Kirjakauppa is 56 in Finland and it also has an internet shop that delivers orders via post. The borrowings from the Helmet libraries variable have data on the top 100 most borrowed novels each quarter of the year.

Table 1. Descriptive statistics of variables

Variables	Min - Mean - Max
Novel borrowings*	456 - 884.96 – 2,549
Price (€)	9.95 - 31.88 - 69
Author's publications	1 - 11.56 - 60
Bestseller 2013, hardcover** (sales)	11,500 - 30,630 – 62,800
Bestseller 2013, paperback**	14,300 - 25,996 – 32,400
Bestseller 2014, hardcover**	8,800 - 26,202 – 73,800
Bestseller 2014, paperback**	12,100 - 17,541 – 30,300
Bestseller 2015, hardcover**	11,700 - 24,919 – 54,900
Bestseller 2015, paperback**	8,600 - 16,939 – 32,700
Bestseller 2016, hardcover**	7,100 - 22,307 – 55,600
Bestseller 2016, paperback**	9,514 - 14,989 – 29,952
Bestseller 2017, hardcover**	10,800 - 20,274 – 59,800
Bestseller 2017, paperback**	8,400 - 11,572 – 16,000
Suomen Kuvalehti	0 - 0.218 - 1
Parnasso	0 - 0.123 - 1
Helsingin Sanomat	0 - 0.618 - 1

Notes: * Each quarter's borrowings are considered as a new observation; ** Only 20 bestselling novels are listed, both domestic and translated. About 22 percent (12 percent, 62 percent) of books have been presented (critics review in weekly magazine *Suomen Kuvalehti*, or in bimonthly published magazine *Parnasso* or in newspaper *Helsingin Sanomat*)

The mean of the variable is about 885, whereas the ultimate number of borrowings is 2,549 per quarter during the sample period. An average author on the top 100 list has had 11 or 12 publications, including one (or more) novels on this list. The bestseller list covers only the top 20 novels in both domestic and translated literature. Moreover, there is a paperback top-20 list as well. Paperbacks, which are usually published later than hardcovers, are on average cheaper, and often do not sell strongly.

The other dummies (0 or 1 indicating that the novel belongs to the top 20) show that the novel is in the top-20 bestselling charts each year (TOP13, TOP14, TOP15, TOP16, and TOP17), that the novel is nominated as a Finlandia Prize candidate (CAN13, … CAN17, usually six novels), and that the novel was given the prize (PRIZE13, …, PRIZE17). The Finlandia Prize is the most important annual prize and receives a great deal of attention in the Finnish media. The winner is announced at the end of the year, therefore PRIZE13 is used in the estimations.

Helsingin Sanomat is the most circulated newspaper in Finland, particularly in the Helsinki region. *Suomen Kuvalehti* is a popular magazine published weekly and is considered as one of the leading magazines among the educated classes. *Parnasso* is the most important magazine in the field of literature, and it publishes seven issues a year. The dummy variables *Helsingin Sanomat*, *Suomen Kuvalehti*, and *Parnasso* indicate whether there is a book review. These publications feature many reviews whose referred books are not listed in the most borrowed novels. Each issue of *Parnasso* has about 10 reviews and approximately one or two of their referred books are seen in the most borrowed list.

5. Estimation and Results

The coefficients of the variables are interpreted as follows: when referred to significant positive or negative effects, it implies that the corresponding coefficients are significant and at a 5 percent level (*), 1 percent level (**), or 0.1 percent level (***). The significance is related to the probability of the coefficient being zero. Hence, with *** it is very unlikely (0.1 percent) that the coefficient is zero, so then we have a strong likelihood that the variable (say, price) has an impact on borrowing demand.

Table 2. Estimation results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
log price	-0.113***	-0.097***	-0.105***	-0.094**	-0.112***	-0.100***	-0.105***	-0.098***
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.030)	(0.031)	(0.030)
log quarters	-0.061***	-0.065***	-0.066***	-0.067***	-0.062***	-0.067***	-0.067***	-0.069***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.009)	(0.010)	(0.009)
log publications	0.000	0.000	0.000	0.000				
	(0.000)	(0.000)	(0.000)	(0.000)				
Publication: 1					-0.006	-0.003	-0.001	0.001
					(0.045)	(0.044)	(0.045)	(0.044)
Publications: 2–5					0.059	0.059	0.053	0.055
					(0.044)	(0.043)	(0.043)	(0.043)
Publications: 6–10					0.006	0.003	0.011	0.008
					(0.045)	(0.044)	(0.045)	(0.044)
Publications: 11–20					0.088*	0.071	0.072	0.068
					(0.044)	(0.044)	(0.044)	(0.044)
Publications: 21–30					0.190***	0.200***	0.194***	0.205***
					(0.045)	(0.044)	(0.045)	(0.044)
Publications: 31–40					0.017	0.018	0.019	0.020
					(0.052)	(0.051)	(0.051)	(0.051)
TOP13	0.088***	0.095***	0.093***	0.095***	0.079***	0.084***	0.082***	0.084***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.021)	(0.022)	(0.022)	(0.022)
TOP14	0.076***	0.071***	0.073***	0.070***	0.083***	0.074***	0.080***	0.073***
	(0.020)	(0.021)	(0.020)	(0.021)	(0.019)	(0.020)	(0.020)	(0.020)
TOP15	0.193***	0.203***	0.188***	0.197***	0.188***	0.202***	0.183***	0.199***
	(0.018)	(0.018)	(0.018)	(0.019)	(0.018)	(0.018)	(0.018)	(0.018)
TOP16	0.139***	0.122***	0.145***	0.126***	0.136***	0.115***	0.140***	0.117***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)	(0.019)	(0.019)	(0.020)
TOP17	0.173***	0.187***	0.177***	0.186***	0.189***	0.202***	0.191***	0.200***
	(0.027)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
CAN12		0.261***		-0.212		0.266***		-0.152
		(0.070)		(0.189)		(0.069)		(0.184)
CAN13		0.083		0.054		0.105(*)		0.082
		(0.062)		(0.072)		(0.060)		(0.071)
CAN14		0.147**		0.107*		0.176***		0.151**
		(0.047)		(0.053)		(0.046)		(0.052)
CAN15		0.067		0.002		-0.010		-0.155
		(0.074)		(0.104)		(0.072)		(0.102)
CAN16		0.316***		0.285***		0.317***		.0.293***
		(0.065)		(0.070)		(0.064)		(0.068)
PRIZE12			0.336***	0.548**			0.327***	0.486*
			(0.076)	(0.203)			(0.075)	(0.199)
PRIZE13			0.149	0.100			0.158	0.078
			(0.113)	(0.131)			(0.110)	(0.128)
PRIZE14			0.237**	0.155			0.228*	0.100
			(0.086)	(0.096)			(0.085)	(0.095)
PRIZE15			0.111	0.131			0.108	0.281*
			(0.098)	(0.138)			(0.096)	(0.136)
PRIZE16			0.410**	0.174			0.387*	0.154
			(0.157)	(0.168)			(0.154)	(0.164)
Helsingin Sanomat	0.065***	0.059***	0.058***	0.058***	0.064***	0.057***	0.057***	0.056***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.014)	(0.015)	(0.014)
Parnasso	0.060**	0.032	0.054*	0.035	0.070**	0.036	0.059**	0.036
	(0.226)	(0.023)	(0.022)	(0.023)	(0.022)	(0.023)	(0.022)	(0.023)
Suomen kuvalehti	0.078***	0.064***	0.074***	0.063**	0.089***	0.078***	0.087***	0.078***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
constant	7.018***	6.968***	6.994***	6.961***	6.951***	6.915***	6.934***	6.909***
	(0.107)	(0.107)	(0.107)	(0.107)	(0.113)	(0.112)	(0.112)	(0.112)
R^2	0.194	0.214	0.210	0.218	0.235	0.258	0.250	0.261
F	36.21***	28.36***	27.70***	22.30***	31.87***	27.49***	26.43***	22.79***

Looking at Table 2, OLS, the dependent variable is log borrowings per quarter, years 2014–2017, top 100, n = 1,600, the variable quarters refer to the number when the book is listed in top 100, publications refer to the number by the author with several dummies ranging from 1 to more than 40 (base case). Further down the table, TOP13 to TOP17 refer to the book's bestseller status (one is listed in the top-20 bestselling list of either hardcovers or paperbacks), CAN12 to CAN16 refer to the book being a candidate for the Finlandia Prize in that year (2012 to, 2016), PRIZE12 to PRIZE16 reflect that the book received the Finlandia Prize, and finally *Helsingin Sanomat*, *Parnasso*, and *Suomen Kuvalehti* dummies refer to a critic's review being published in the newspaper or magazine during or before the quarter in question. In Table 2, only price, quarters, and publication variables are transformed (using logarithms) before estimations, whereas in Table 3 more variables have been transformed. In the case of logarithms, the coefficients are interpreted as elasticity with respect to this variable (e.g., price elasticity). If the variables have not been transformed, then the coefficient measures how much (or how little) the borrowing demand increases (or decreases) if there is a change in the corresponding variable. For example, if there is a book review published in *Helsingin Sanomat*, it will increase the logarithm of the borrowings by 0.05– 0.06, which equals to approximately 5–6 percent increase.

The model estimated includes a bestselling variable, either TOP13 to TOP17, or Bestseller Hardcover and Bestseller Paperback for each year from 2013 to 2017 —labeled "TOP13," "BS13Hardcover," or "BS13Paperback" respectively. Previous publications by the author include two alternatives; the log of publications or several dummies: Pub1 (first publication), Pub2345 (the number of publications by the author is from 1 to 5), Pub6_10 (number of publications by the author is from 6 to 10) , Pub11_20 (publications 11–20), Pub21_30 (publications 21–30), and Pub31_40 (publications 31–40 or more), which is the baseline assumption in the estimation indicating ranges of publications; also a Finlandia prize nomination each year from 2012 to 2016 (CAN12, …, CAN16), and prize awarded each year from 2021 to 2016 (PRIZE12, …, PRIZE16).

The last year (2017) nomination and prize are not included due to the rather late date of the publication. They are believed to not have any impact on public library borrowing as the novels nominated in 2017 are not among the top 100 borrowings from the Helmet libraries. The reviews published in *Helsingin Sanomat*, *Parnasso*, or *Suomen Kuvalehti* are considered as well as the list price of the novel in the book retailer Suomalainen Kirjakauppa. Many of the bestselling novels are sold across several bookstores and department stores, including

Suomalainen Kirjakauppa, and the prices are not equal among the different retailers. Public libraries need not purchase books through Suomalainen Kirjakauppa, but the bookstore is the largest in the Helsinki area and is therefore a reasonable seller that caters to conventional readers.

Table 3. Estimation results

	Model 9	Model 10	Model 11	Model 12	Model 13
log price	-0.107***	-0.113***	-0.105***	-0.110***	-0.104***
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
log quarters	-0.059***	-0.065***	-0.070***	-0.070***	-0.072***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Publication: 1	0.066	0.041	0.040	0.042	0.042
	(0.045)	(0.045)	(0.044)	(0.044)	(0.044)
Publications: 2–5	0.109*	0.095*	0.095*	0.092*	0.094*
	(0.043)	(0.043)	(0.042)	(0.043)	(0.043)
Publications: 6–10	0.064	0.052	0.048	0.053	0.050
	(0.044)	(0.045)	(0.044)	(0.044)	(0.044)
Publications: 11–20	0.120**	0.115**	0.095*	0.096*	0.091*
	(0.044)	(0.044)	(0.043)	(0.043)	(0.043)
Publications: 21–30	0.205***	0.198***	0.207***	0.200***	0.211***
	(0.044)	(0.044)	(0.044)	(0.044)	(0.044)
Publications: 31–40	0.011	0.006	0.009	0.009	0.008
	(0.051)	(0.051)	(0.050)	(0.051)	(0.050)
Log BS13Hardcover	0.012***	0.012***	0.013***	0.012***	0.013***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log BS14Hardcover	0.010***	0.008***	0.007***	0.008***	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log BS15Hardcover	0.017***	0.016***	0.016***	0.015***	0.016***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log BS16Hardcover	0.012***	0.010***	0.008***	0.010***	0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log BS17Hardcover	0.017***	0.017***	0.017***	0.017***	0.017***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Log BS13Paperback		-0.001	-0.001	-0.001	-0.001
		(0.003)	(0.003)	(0.003)	(0.003)
Log BS14Paperback		-0.003	-0.003	-0.003	-0.003
		(0.002)	(0.002)	(0.002)	(0.002)
Log BS15Paperback		0.005**	0.006**	0.005**	0.006**
		(0.002)	(0.002)	(0.002)	(0.002)
Log BS16Paperback		0.003*	0.003(*)	0.004**	0.003(*)
		(0.001)	(0.001)	(0.001)	(0.001)
Log BS17Paperback		0.006**	0.007**	0.007***	0.008***
		(0.002)	(0.002)	(0.002)	(0.002)
CAN12			0.274***		-0.161
			(0.068)		(0.180)
CAN13			0.031		0.031
			(0.060)		(0.070)
CAN14			0.161***		0.169**
			(0.046)		(0.052)
CAN15			-0.044		-0.170(*)
			(0.072)		(0.101)
CAN16			0.324***		0.302***
			(0.064)		(0.068)
PRIZE12				0.340***	0.508**
				(0.074)	(0.195)
PRIZE13				0.036	0.003
				(0.109)	(0.126)
PRIZE14				0.119	-0.024
				(0.087)	(0.098)
PRIZE15				0.052	0.234(*)
				(0.096)	(0.133)
PRIZE16				0.397**	0.158
				(0.152)	(0.161)
Helsingin Sanomat	0.073***	0.067***	0.061***	0.060***	0.060***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Parnasso	0.043(*)	0.047*	0.020	0.040(*)	0.018
	(0.022)	(0.022)	(0.023)	(0.022)	(0.023)
Suomen kuvalehti	0.043*	0.059**	0.052**	0.062**	0.054**
	(0.018)	(0.019)	(0.019)	(0.019)	(0.019)

constant	7.369***	7.446***	7.428***	7.450***	7.428***
	(0.117)	(0.121)	(0.120)	(0.121)	(0.120)
R²	0.256	0.274	0.286	0.276	0.288
F	35.44***	28.41***	25.66***	24.46***	21.95***

Models 1–4 exclude dummy variables that indicate the number of author publications present in models 5–8. In the first models (1– 4) the logarithm of author publications is included. The dummy-variable alternative is better because the logarithm variable is not statistically significant in any model, whereas the dummy alternative seems to significantly highlight the idea of the most borrowed books if the author has more than 20 and less than 31 publications ceteris paribus including the explanation of other variables. Models 1, 3, 5, and 7 do not use the information of a publication being a candidate for the Finlandia Prize. The actual prize winners are present in models 3, 4, 7, and 8.

Table 3 presents the estimation results that include the bestselling top 20 novels list, either hardcover or paperback books. Here, OLS, the dependent variable is log borrowings per quarter, years 2014–2017, top 100, n = 1,600, the variable quarters refer to the number when the book is listed in the top 100, publications refer to the number by the author with several dummies ranging from 1 to more than 40 (base case). In addition, BS13Hardcover,…, BS17Paperback refer to the number of either hardcover or paperback copies sold each year from 2013 to 2017, CAN12 to CAN16 refer to the book being a candidate for Finlandia Prize in that year (2012,to, 2016), PRIZE12 to PRIZE16 means that the book received the Finlandia Prize, and finally *Helsingin Sanomat*, *Parnasso*, and *Suomen Kuvalehti* dummies refer to a critic's review being published in the newspaper or magazine during or before the quarter in question. This is an alternative to results in the table where the relevant information is a dummy variable, indicating the book belongs to the top list without an actual sales figure. The estimation results in Tables 2 and 3 show that the retail price of the novel has a negative impact on public-library borrowing (first line in Tables 2 and 3, for example -0.113 in model 1). This is in line with the model presented, indicating that the public library is bound to obey financial limitations. The demand is price inelastic, with approximately -0.1 price elasticity, which supports the first hypothesis (H1). The estimated value of the quarters is negative, showing that borrowings on average decline as time goes on. The demand is highest when the novel has been published, such as log quarters: -0.061 in model 1.

The author recognition measured by the number of publications is not significant, however, dummies representing various amounts—1, 2–5, 6–10, 11–20, 21– 30, 31–40—when

the reference value is more than 41 publications seem to place the peak of borrowings if the author has about 21–30 novels. Bestselling novels—measured as belonging to the top 20 list (Table 2) or hardcover sales (Table 3)—seem to attract more borrowings, such as top13: 0.088 in model 1. Paperback sales have little to no importance on borrowings. Typically, the paperback edition is released much later than the hardcover, at a time when the novel is no longer on the top-borrowing list.

The nominations for or the winnings of the Finlandia Prize can have an important and significant impact on borrowings, but not always. Although the nomination or reward for the prize in the years 2013 and 2015 is not significant, the prize given in 2012 had a positive impact even though there is a longer delay of more than one year. This result is like the one observed by Ashworth et al. (2010) who noticed the result with book sales. Reviews in the literature magazine *Parnasso* are significant if the nomination variable is not included; otherwise *Parnasso* is not significant, as the magazine has a limited circulation. The reviews in *Suomen Kuvalehti* and *Helsingin Sanomat*, however, seem to have a positive impact. Still, it is worth noting that only a fraction of novels reviewed in *Suomen Kuvalehti* or *Helsingin Sanomat* are seen in the top 100 listing. Therefore, the second hypothesis (H2) receives some support, however, not all types of public awareness influence borrowing demand.

The coefficient of determination in the estimated models is less than 0.3, indicating that many borrowings remain unexplained. Many of the top 100 are crime, mystery, or romance novels. Nevertheless, the categorization based on the genre has not been precisely made. The most important prizes given in Finland are not typically given to crime or mystery novels, but they nonetheless seem to appear in the top list.

6. Conclusion and Implications

The research questions presented in the introduction have been carefully studied in this article: what is the role of purchasing price, and what is the role of public awareness on public library loans? The estimation results point out the significance of public awareness of novels in determining the demand for borrowing. Bestselling novels are widely borrowed from public libraries, and the reviews in newspapers and magazines with a wide circulation are crucial in creating awareness. This has a twofold effect: they increase both purchasing demand and borrowing demand. Publishers may wish to give sample copies to reviewers and hence increase the demand. Both the nomination and winning of the Finlandia Prize are important in increasing awareness, however, they do not always have an impact on borrowing.

The author-publication record is essential, but the highest peak in borrowing occurs when the author has published about 20–30 publications, based on the estimation results in Tables 2 and 3. Public libraries maintain a vital position in Finland because they enable and promote equal opportunities to access publications such as novels, poems, magazines, and newspapers free of charge. Books in great demand indeed have a long queue, and borrowers must wait, sometimes for a very long time. This new result in the article is that borrowing demand is price-inelastic, indicating that public libraries must take financial restrictions into account. This can be challenging, because novels lose their relevance quickly (Kannila, 1966). Moreover, both stated hypotheses receive support in the empirical setting.

Public libraries must comply with economic efficiency. They have a binding budget, and they simply cannot purchase enough books and other publications to satisfy the whole population. Therefore, the price of the book is of vital consequence. The estimation results show that in this case the demand for borrowings has a negative price elasticity, indicating that scarcity exists in the book stock; this result is novel and has not been proposed elsewhere. Libraries do not have enough copies of books in relation to demand, but due to a lack of financial resources libraries cannot supply everything. Still, public-library managers must react to public awareness regarding the novel or the author, and purchase more books if needed, to satisfy the borrowing demand.

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